Guenakh Mitselmakher

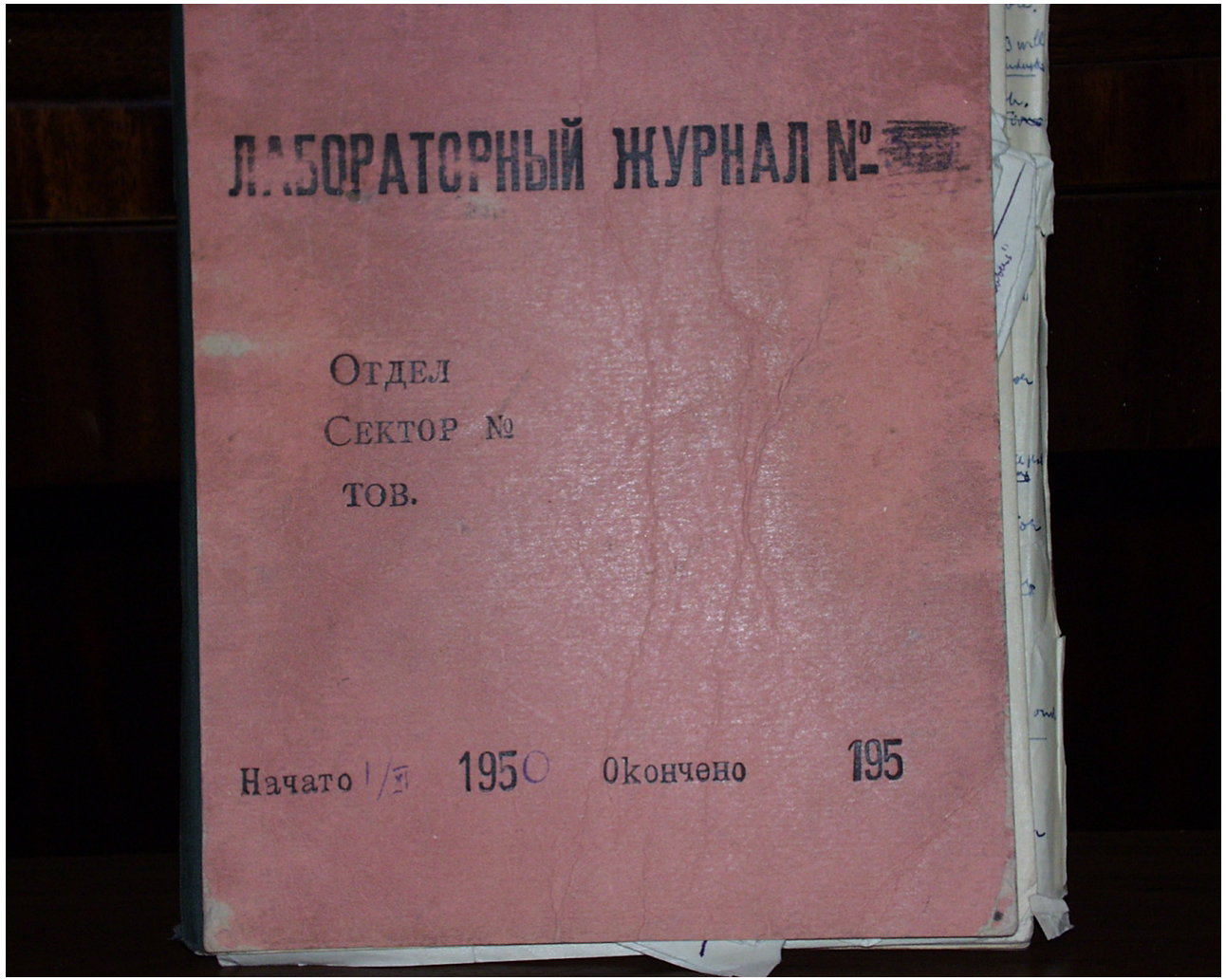
Pisa, September 18, 2013

Bruno Pontecorvo in Dubna

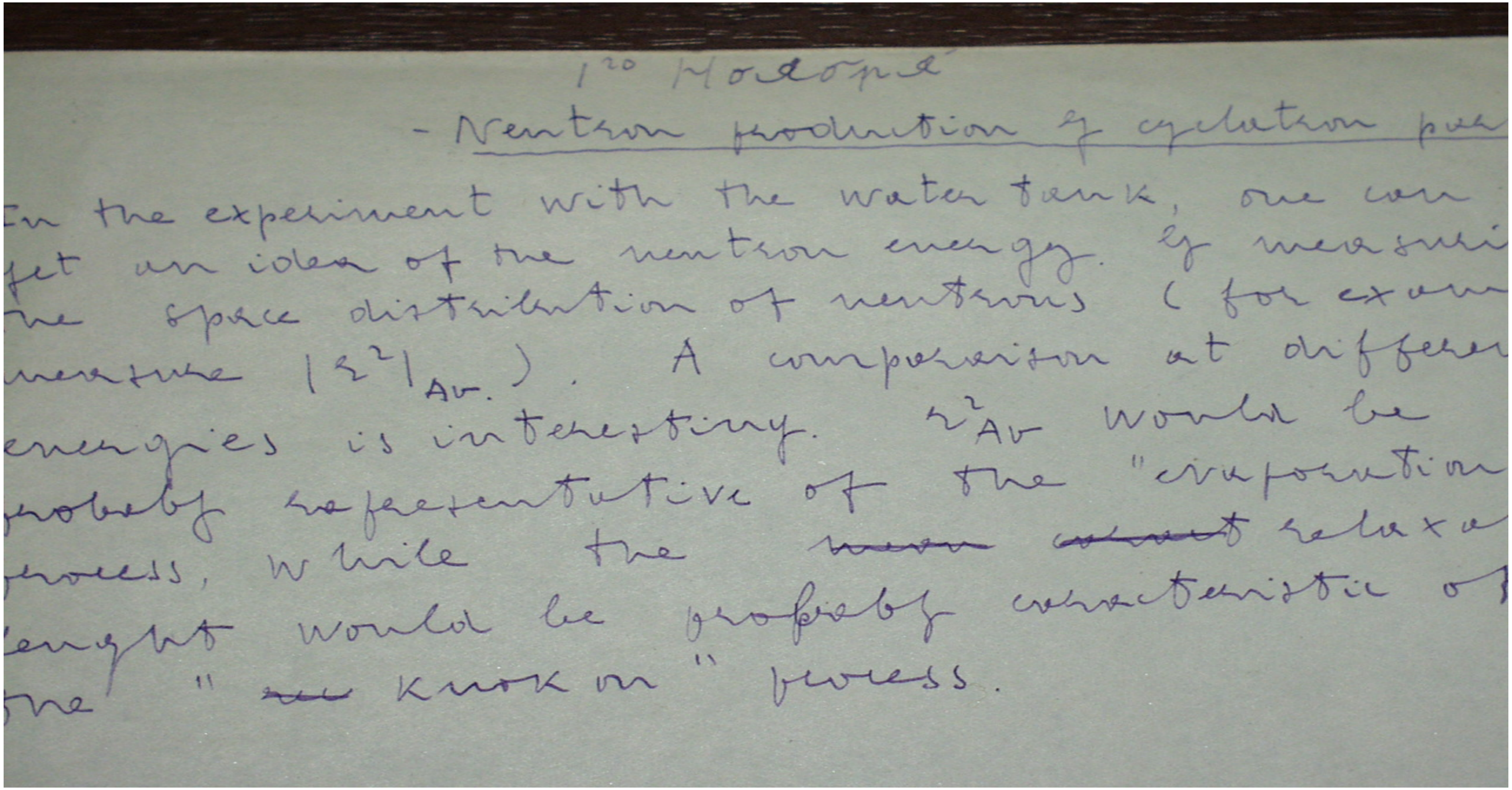
personal recollections by a former student

On the back of the picture: *"2+2=4! You have to know this! – B.P."*. Dubna, 1978.

- A privilege to to interact with Bruno Pontecorvo closely, for nearly 20 years, played a formative role in my life
- I saw Bruno as a very unusual person: not only fantastically talented in many areas, but also deeply original, not similar to anyone I knew
- Interactions with Bruno have been very important not only for me, but for many people in Dubna and more generally, in Russia. There are many Russian scientists who presented and even published their very interesting recollections about Bruno's life and scientific work in Russia. I must say that my point of view is very personal and subjective, I am not a historian and my knowledge of facts is limited, but I decided that it is better for me to stick to things I know better…
- Bruno arrived to Dubna in 1950, after his departure with his family to the Soviet Union. This was well before my time in Dubna, I came to Dubna in 1966.
- Here are some pictures related to Bruno in USSR in Dubna, still before my time…until 1956 Dubna was a closed city, despite only fundamental research was carried out there (the most powerful cyclotron was built in Dubna in 1948, Bruno was one of the first users of this machine, doing elementary particles research



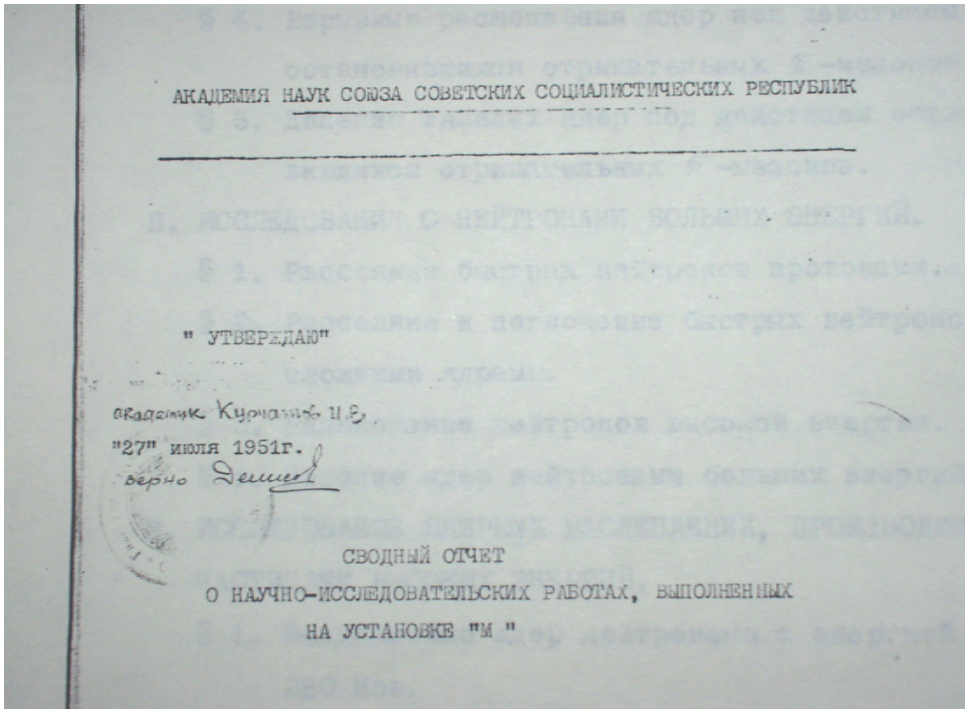
Secret logbook in Dubna in the beginning of 50-s, pages numbered!



- Neutron production by cyclotron pro

In the experiment with the water tank, one can
get an idea of the neutron energy by measuri
the space distribution of neutrons (for exam
measure $|r^2|_{Av.}$). A comparison at differen
energies is interesting. r^2_{Av} would be
probably representative of the "evaporation
process, while the ~~mean~~ ~~about~~ relaxa
lenght would be probably characteristic of
the " ~~[illegible]~~ knock on" process.

First entry by Bruno in the 1950 scientific (but secret!) logbook.



АКАДЕМИЯ НАУК СОЮЗА СОВЕТСКИХ СОЦИАЛИСТИЧЕСКИХ РЕСПУБЛИК

" УТВЕРЖДАЮ"

академик Курчатов И.В.

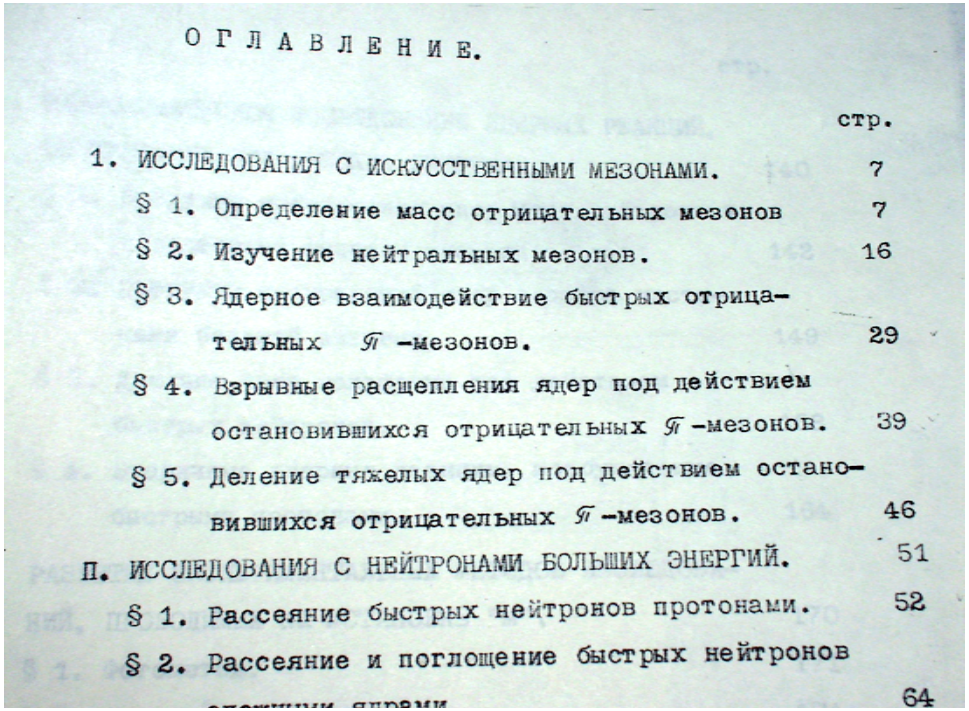
"27" июля 1951г.

верно Дешет

СВОДНЫЙ ОТЧЕТ

О НАУЧНО-ИССЛЕДОВАТЕЛЬСКИХ РАБОТАХ, ВЫПОЛНЕННЫХ

НА УСТАНОВКЕ "М "



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- **best world accelerator of that time (480 MeV)**

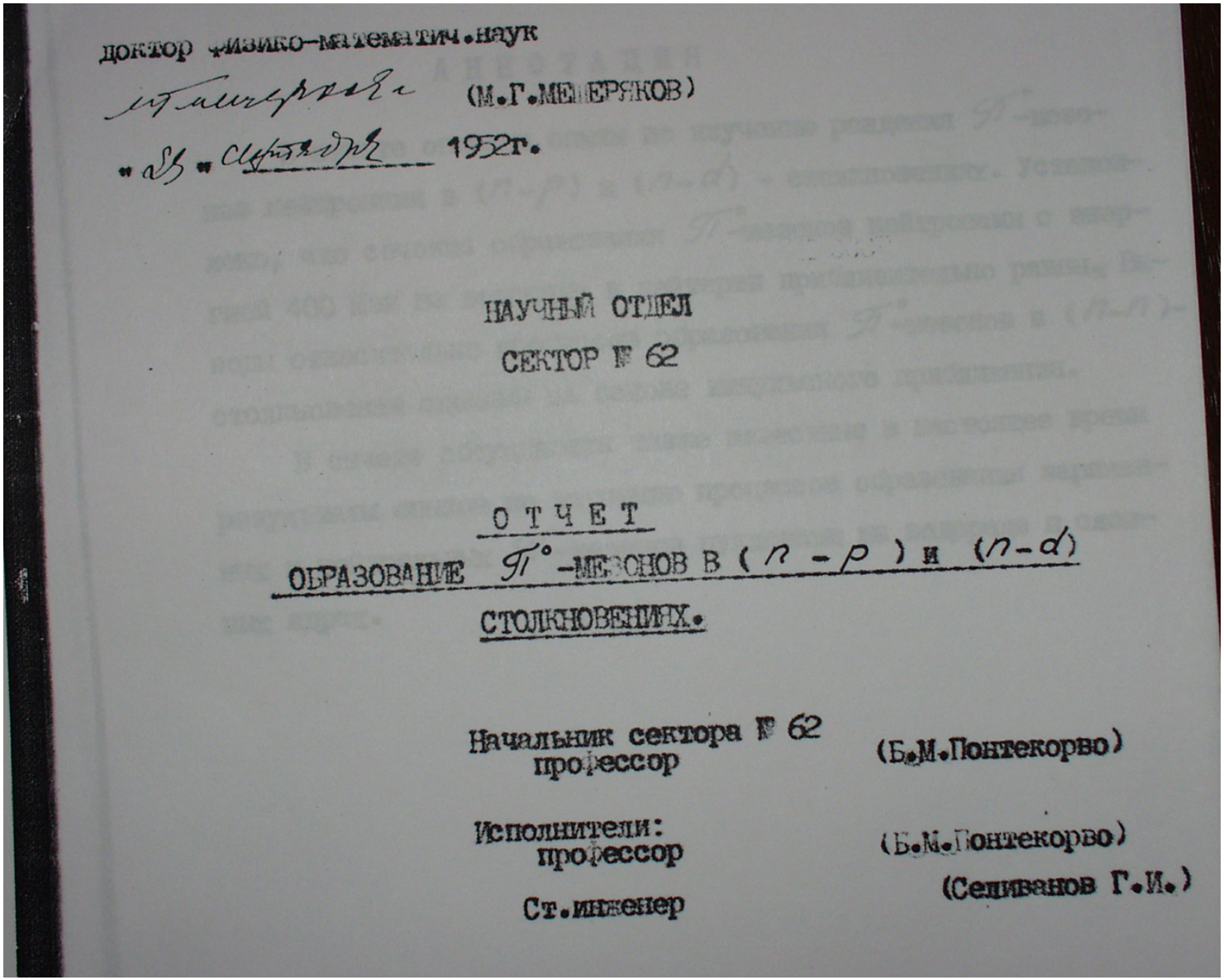
but no shielding (Bruno)

- **no war applications,**

but severe secrecy (recollections by Goldansky, Ioffe)

- **young personnel,**

  Bruno at 37 years – older "Professor"



доктор физико-математич.наук

(М.Г.МЕЩЕРЯКОВ)

"25" сентября 1952г.

НАУЧНЫЙ ОТДЕЛ

СЕКТОР № 62

ОТЧЕТ

ОБРАЗОВАНИЕ π^0-МЕЗОНОВ В $(n-p)$ и $(n-d)$ СТОЛКНОВЕНИЯХ.

Начальник сектора № 62
профессор (Б.М.Понтекорво)

Исполнители:
профессор (Б.М.Понтекорво)

Ст.инженер (Селиванов Г.И.)

A “secret” report written by Bruno: production of pi-mesons…

- And few more pictures with other physicists from later times in Dubna, most of them after I joined Bruno's department

J. Laberrigue-Frolow, T. Blokhintseva, L. Nemenov, B. Pontecorvo, Dubna, 1964. Bruno helped many in USSR to find their way in Science. Tatiana Blokhintseva is here today

Bruno Pontecorvo and Lev Okun, 1970-s. Okun and Pontecorvo have been friends and collaborators

B. Pontecorvo, V. Grishin, Yu. Prokoshkin, 1970-s

Prokoshkin left Dubna for Serpukhov and became a leading experimetalist there

S. Gershtein, B. Pontecorvo at the construction site of the Baksan Neutrino Observatory, Institute of Nuclear Research, in 1974. Several physicists from INR, Moscow, working in the Baksan lab are today in the audience…

B. Pontecorvo and S. Bilenky at a seminar in 1977. “ not too boring…”

Samoil Bilenky, a long term collaborator of Bruno, is here today, as is Serguey Petcov, also a collaborator of Bruno in Dubna

- Besides the most important thing: deep influence on my scientific interests, and in several cases, an influence on the direction of my research, I am deeply obliged Bruno for friendship and direct help in critical moments in my life for 20 years: hiring to Dubna, helping to overcome a very serious opposition from local party leaders when formally appointing me a group leader and then department head in Dubna.
- When the Soviet Union became more open to interactions with the world in the 80-s, Bruno helped me to establish scientific and personal contacts with western scientists.
- Beginning of 90-s was a very difficult time for science in Russia: the support for science all but disappeared. At the same time the country finally was open for travel and contacts. Bruno wrote a recommendation letter for me, which helped me to move to the West to continue my career as physicist. At that time I did not know many people in the West (I could not travel to the West for many years).

- Bruno moved to Soviet Union in 1950, at the age of 37 years. At that time he was already recognized as one of the very best scientists in the world. I will not discuss here Bruno's life before the Dubna period, and I will not discuss his scientific achievements: I expect others at this conference to do that, instead I will present mostly personal recollections.
- Before going into more details, I want to mention one quality of Bruno which in my view distinguished him from many other excellent scientists: his superb taste in physics.

- Bruno was a Professor at Moscow State university for many years, many students have been listening to his excellent lectures. Besides, he helped many young particle physicists to find their way in Science. Sasha Olshevsky
- Here I will give my example. I have been recommended for the PhD studies in the Moscow State University graduate school. For some reason, the final decision on who is admitted to the graduate school, as many other decisions in the Soviet Union, have been taken by a Communist Party Committee at the University and I was not recommended, as I then thought, deservingly (I was not a perfect student and had disciplinary reprimands)

  Bruno tried to defend my candidacy for a graduate school at the Party Committee meeting, and when he failed, he offered me a position in his department in Dubna, and later a topic for my PhD dissertation on the search of the lepton number nonconservation in muon decays. I was young, did not understand physics and life in general, and Bruno had to convince me that it is an interesting and a very important topic, and that working n his department in Dubna is good. Of curse all of this largely defined my life and my scientific interests for many years. There is an appropriate Russian saying, an approximate English translation is: «every cloud has a silver lining»

- I heard this words, about the importance of taste in physics, from Bruno several times. Usually the word taste is reserved not for science, but for art and some other areas in life. With respect to science, in similar situations, we usually use the word intuition. I feel that a taste is somewhat different and probably means more than an intuition...while intuition is the ability to see the truth without a proof, a taste in science includes also the ability to see in a simple way what is important, often before others recognize it.

- Of course today we all know very well how important is the concept of generations, and the topic of leptons mixing. We understand it particularly well after the discovery of neutrino oscillations. Still, most likely what we know in this area today is just the beginning, and the future research in this area will define a lot in the future particle physics and cosmology. This will be discussed in some depth at this symposium.

- I think that Bruno at least in some part learned (if it is possible to learn this at all) the sense of taste in physics from his teacher, whom he worshiped: Enrico Fermi. As Fermi, he was able to see simple beautiful ideas, important for the future of physics. Somehow Bruno was able to know what problem is important, and even foresee a solution long before the problem was even recognized by the others…
- Of course today we all know how important is the concept of generations, and the concept of lepton mixing and lepton number violation. We understood it particularly well after discovery of neutrino oscillations.
- Bruno understood it (or sensed, not sure how to say correctly) earlier than most, likely earlier than anybody. Not accidentally this was the main area of his research for much of his life. He proposed many pioneering ideas in this area, often doing pioneering experimental research himself (particularly when he was still in the West where the conditions for experimental research were better)
- Neutrino physics which was at the center of his research for many years is (only?) an (important and beautiful) part of this larger area, There are also rare decays, CP-violation and leptogenesis in cosmology…it may be a key to many problems in physics. I think the role of Bruno's ideas in physics will only grow.

- Bruno was very important for Dubna becoming an integral part of the international physics community, part of the collaborative international research in physics. In Soviet times, when Soviet physicists have been largely isolated, and Bruno himself could not travel to the West for tens of years (he had restrictions on visiting even some scientific centers in the Soviet Union), it was not simple
- As an example: Bruno was very supportive of the idea of participation of my group in the DELPHI experiment at CERN. He highly recommended our group to Ugo Amaldi, this was important both for the recognition of our group, and for the success of DELPHI. Ugo mentioned this in conversations with me several times.

1991

- I believe that due to my family history I understand well the motives of Bruno's departure in 1950 to the Soviet Union. My father lived in Lithuania before the World War II, when Lithuania was not a part of the Soviet Union. My father was a well-off medical doctor, at the same time he shared in a very idealistic way a philosophy of communism. Similar views were quite popular among intellectuals in the west at that time, partly as a reaction to Mussolini, Hitler, Franco and their followers. Bruno had similar views, as I know he was deeply influenced by the civil was in Spain in 1930-s…and my father went as a volunteer in international brigades to this war . We discussed it with Bruno.
- Bruno's political views have evolved very seriously with time, particularly after he experienced first hand for many years the realities of life in the Soviet Union…we also discussed it…Of course evolution of Bruno's political views was graduate. It is very difficult to change the views adopted in youth, as it is difficult to have doubts in a religion adopted in youth. Not accidentally Bruno later compared the philosophy of communism with a religion. Until the end of his life, Bruno was a democrat and believed in the principles of social justice, as he did in his youth. A mistake of his youth was that he also believed that these principles are an integral part of a society in a communist country…

- Let me discuss one episode. In 1889 I spent a lot of time at CERN working on DELPHI. In 1889 Bruno has visited CERN for the first time on invitation from Then DG of CERN Carlo Rubbia. Bruno was allowed to travel to the West by the Soviet authorities since 1979, but before 1989 he traveled practically every year exclusively to Italy, I believe it was more important for him personally…
- At CERN I was practically all the time with Bruno, trying to help him as much as I could, Bruno was over 75 years old, and had Parkinson… On the request from Bruno I drove him to visit his famous older brother, biologist Guido, who was retired and lived alone high in the mountains in Valais in Alps. The brothers met for the first time after almost 40 years…

1989

Guido (left) and Bruno Pontecorvo:

Immediately after they met after nearly 40 years…

(I took the picture)

- Cannot help remembering the first conversation of the brothers after 40 years…
- Guido “ and how are you there?…” (in the Soviet Union)
- Bruno gestured not really approvingly…
- Guido: “ I told you so!”
- It was like if they continued a conversation which started 40 years ago…it was clear that political views were different, it was also clear who was the older brother…

1989

And one more picture take from my camera dutring first visit of Bruno to CERN. First meeting of Bruno Pontecorvo nad Jack Steinberger after so many years. Jack introduced Bruno before his seminar at CERN